Annual Report

FOREST PEST CONDITIONS IN WISCONSIN

1955

WISCONSIN CONSERVATION DEPARTMENT

FOREST MANAGEMENT DIVISION

FOREST PESTS — SURVEY AND CONTROL

ANNUAL REPORT

FOREST PEST CONDITIONS IN WISCONSIN

1955

By
Wisconsin Conservation Department
Forest Management Division

In Cooperation With
Lake States Forest Experiment Station, Forest Service, U.S.D.A.
Wisconsin Department of Agriculture--State Entomologist
State of Illinois
University of Wisconsin
Private Industry
Counties

TABLE OF CONTENTS

	Page
Introduction	1
Importance of the Entomological Phase of Forestry	1
Cooperation, Integration, Achievement	1
Forest Pest Control Law	2
Agreement with Department of Agriculture	7
Work Plan	10
Forest Pest Control Steering Committee	12
Meetings * Conferences * Schools	13
Publications of Interest	14
Direct Control Operations	15
List of Insects and Diseases Reported	16
More Important Infestations	16
Infestations of Lesser Importance	19
Miscellaneous Insects Reported	19
Some Diseases Reported in 1955	21
Areas of the More Important Infestations	22
Forest Tent Caterpillar Infestation Prediction - 1956	33

INTRODUCTION

IMPORTANCE OF THE ENTOMOLOGICAL PHASE OF FORESTRY

Forest protection is, without doubt, one of the important problems in the administration of forests, and it is the one to which the greatest attention has been given in organizing the work of the federal, state, county, and private forests along protective lines.

Forest protection does not, in the strict sense, mean safeguarding against fire alone. Destructive insects and plant diseases may do far more damage each year than fire. Because their work often is nonspectacular, the damage done often is not immediately recognized.

The problems of the silviculturists, in many areas, are intimately connected with problems of pure and applied entomology. For this reason, it is essential that foresters have a broad understanding of the technical and economic phases of the subject of forest entomology and that they appreciate thoroughly the importance of the various insects which they may have to combat in the management of their stands.

It is a difficult problem to place a monetary value upon the total damage that insects do to the forest. The forester may measure the value of the wood product by loss in increment and possible degrading of the final product but forestry is also concerned with other values inherent in the forest which are less easily measured. Among these are watershed cover, recreational value, wildlife habitat, etc.

Some estimates place the loss of forest resources in the nation due to insects at more than $200,000,000 annually. The U.S. Forest Service places the loss conservatively at seven times that resulting from fires. Such interpretations necessarily depend upon the establishment and interpretation of values and the specific problems that were studied.

COOPERATION, INTEGRATION, ACHIEVEMENT

The pest control organization in Wisconsin is becoming more proficient as the problems are better understood and closer cooperation is experienced among the several state agencies, counties, industry, neighboring states, federal agencies, and the neighboring provinces of Canada. The objective of forest pest control, the production of healthy vigorous stands of timber, is becoming more of a reality. The excellent results obtained in cases where intensive forest management was practiced have not gained much attention since what has been prevented or has not occurred is not spectacular. Nevertheless, greatest emphasis continues to be given to forest management practices since preventive measures are preferred to curative or emergency controls. Striking results have been experienced with the artificial control of the Saratoga spittlebug and several other insect pests. However, many of the problems are extremely complex and will require investigations extending over a long period.

All phases of the program must be intensified to gain a broader perspective, and more quickly arrive at sound solutions that may be incorporated in management plans wherever possible. Surveys on specific insects must be more detailed and more information must be gathered on both the hosts and the more common pests which attack them. More must be known about so-called resistance of the host, site factors, climate, biology, ecology, and various natural and artificial control agencies.

Forest managers can expect continued forest pest activity and must be prepared to consider it in their management plans. The conditions which are conducive to an epidemic must be recognized early. The problem should be attacked in its incipient stage if it is physically possible and economically justifiable. Many outbreaks in the state have been most often associated with overmature stands, pioneer species, pure unnatural stands, and lack of management. With poor forest management, pest problems of 1975 will be born at this time through such mistakes as improper site selection, poor planting technique, substitution of tree species, lack of management, etc. Thus, in solving a current problem, many future problems may be created.

FOREST PEST CONTROL LAW

Below is a copy of the legislation known as the Forest Pest Control Law which was passed by the 1955 legislature. It has been incorporated in Section 26.00, Wisconsin Statutes, Chapter 250, which deals with the protection of forest lands.

To create 26.30 of the statutes, relating to control of forest insect pests and tree diseases. The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

26.30 of the statutes is created to read:

26.30 FOREST INSECTS AND DISEASES; COMMISSION JURISDICTION; PROCEDURE.

(1) Purpose. It is the public policy of the state to control forest pests on or threatening forests of the state in order to protect the forest resources, promote good forest management, enhance the growth and maintenance of forests, promote stability of forest-using industries, aid in fire control by reducing the menace created by dying and dead trees, conserve forest cover on watersheds and protect wildlife, recreational values and other values of the forest.

(2) Powers of the Commission. The commission is vested with authority and jurisdiction in all matters relating to the prevention, detection, and control of forest pests on the forest lands of the state, and to do all things necessary in the exercise of such authority and jurisdiction. It is the intent that this section shall apply only to the detection and control of forest pests on forest lands and nothing in this section shall be construed to affect the authority of the state department of agriculture as outlined in chs. 93 and 94. The action of the commission under sub. (4) shall be co-ordinated with the state department of agriculture in accordance with s. 14.65. The directors of the conservation department and state department of agriculture shall execute annually a memorandum of agreement to enable the co-ordination of pest control work of the two departments.

(3) Definitions. As used in this section:

(a) "Forest pest" means any insect or disease which is harmful, injurious or destructive to forests or timber.

(b) "Forests" or "forest lands" mean any area on which trees exist, standing or down, alive or dead, actually or potentially valuable

for forest products, watershed or wildlife protection, or recreational uses in contrast to shade, horticulture or ornamental trees valuable for landscape, agricultural, aesthetic, or similar purposes.

(c) "Infestation" includes actual, potential, incipient, or emergency infestation or infection by forest pests.

(d) "Control" includes prevent, retard, suppress, eradicate, or destroy.

(e) "Control zone" means an area of land which, in the judgment of the commission, constitutes a present or potential forest pest breeding ground of a nature to be harmful, detrimental, and injurious to permanent forest growth in the district or zone upon which control measures are justified.

(4) Surveys, Investigations, and Control. The commission shall make surveys and investigations to determine the presence, condition, and extent of infestations and it shall also carry on control measures when necessary. For such purposes, the commission or its agents may enter public and private lands at reasonable times without incurring a liability to anyone.

(5) Cooperative Agreements. To carry out the purposes of this section, the commission may enter into arrangements or agreements with the university of Wisconsin, the state department of agriculture, other departments of this and other states, the U.S. department of agriculture and other federal agencies, and with counties, towns, corporations, and individuals.

(6) Responsibility of Forest Landowners. Every owner of forest lands or timber shall exercise every reasonable effort to control and destroy forest pests on forest lands or timber owned by him or under his control. In case of his failure, neglect, or inability to do so, the work may be performed as provided in this section.

(7) Designation of Infestation Control Zones. (a) Whenever the commission finds that an area in the state is infested or threatened with infestation by forest pests, it shall determine whether measures of control are needed and are available at reasonable cost with respect to the value of the forest lands or timber to be protected and the area affected. Such control measures may be applied through cooperative agreements as provided in subs. (5) and (8) or the commission may designate a proposed zone of infestation covering the area in which control measures are to be applied. When a proposed zone on infestation is designated and before the establishment thereof, the commission shall hold a public hearing thereon. Notice of such hearing shall be published in one or more newspapers having a general circulation in the county or counties covered in whole or in part by the proposed zone. The notice shall contain a description of the lands included in the proposed zone of infestation and a time and place where owners of forest lands in the proposed zone may show cause orally or in writing why the zone should or should not be established. The commission shall consider any statements received in determining whether the zone shall be established. If the commission determines that a zone should be established, it shall issue an order establishing the zone of infestation.

(b) Upon the establishment of a zone of infestation by the commission, notice thereof shall be published in one or more newspapers having a general circulation in the area affected by such zone.

(c) When the commission finds that an emergency condition exists and that the delays necessitated by the procedure outlined in pars. (a) and (b) would result in an epidemic or infestation, it may by order establish a zone of infestation without public hearing, giving such notice as it may deem feasible.

(8) Commission to Control Infestation if Owner Fails to Act. Upon the establishment of a zone of infestation, the commission shall apply measures of control on public and private forest lands within the established zone if the owner fails, refuses, neglects, or is unable to undertake adequate control measures. The commission shall endeavor to enter into agreements with owners of forest lands concerning the control work on their lands and fixing a pro rata basis on which the costs of such work will be shared between the state and such owner. Failure of the commission to offer an agreement to or execute an agreement with any owner shall not relieve him of any liability under this act or impair the right of the commission to enter on the lands of said owner to conduct control operations.

(9) Distribution and Collection of Costs. (a) At the completion of the control measures in any area, or at the end of the calendar year, the commission shall prepare a certified statement of the expenses incurred in carrying out such measures including expenses of owners covered by agreements pursuant to sub. (8) but these charges shall not include salary or expenses of regular permanent or seasonal personnel of the commission, or operating costs for such regular equipment as may be owned or purchased by the commission for insect pest control work. The statement shall show the amount which the commission determines to be the state's share of the expenses, but this amount shall not be less than 50 per cent of such expenses incurred on forest lands. The share of the state may include any federal aid funds and the value of contributions made available by other co-operators, but not federal funds allocated to a specific control project. The balance of such costs shall constitute a charge on an acreage basis against the owners of lands in the area affected by the forest pests for which control measures were conducted. In fixing the rates at which charges shall be made against each owner, the commission shall consider present values and the present and potential benefits to such owner and to the state as a whole from the application of control measures, the cost of applying such measures to his land, and other such factors as in the discretion of the commission will enable it to determine an equitable distribution of the costs to all such owners. No charge shall be made against owners to the extent that they have individually or collectively contributed funds, supplies, or services pursuant to agreement, and 160 acres or less of forest land owned by any person within any county shall be exempt from any control cost.

(b) As soon as the expenses incurred by the state in forest pest control work have been paid by the state treasurer, the commission shall send to each landowner, a bill covering an equitable share of such expenses as herein provided.

1. When such work has been performed on county lands, the commission shall send to the proper county treasurer a bill for the county's share of such expenses and a copy of the bill shall be filed with the director of budget and accounts. The county shall have until October 1 of each year to pay such bill. If payment is not made by October 1 of each year, the secretary of state upon information certified to him by the director of budget and accounts, shall include such amount as a part of the next

levy against the county for state taxes, but no county shall be required to pay more than $5,000 of such amount in any one year. Any unpaid levy under this section shall remain a charge against the county and the secretary of state shall include such unpaid sums in the state tax levy of the respective counties in subsequent years.

2. When such work has been performed on other public or private lands the commission shall certify to such owner the claim of the state in writing and list the items of expense incurred in such pest control work. Such claims shall be paid within 60 days and, if not paid within such time, the state may begin an action thereon at any time within 2 years.

3. If any claim is not paid within 60 days, the state may file a mechanics lien within 6 months after the 60-day period expires against the land affected in accordance with ch. 289, and shall have the necessary remedies to enforce the lien.

(10) Dissolution of Infestation Control Zones. Whenever the commission finds that forest pest control within an established zone of infestation is no longer necessary or feasible it may set aside the order establishing the zone.

NOTE: The following information is explanatory of this bill relating to pest control:

1. Responsibility for the control of forest pests will be with the conservation department and the responsibility for duties now being performed by the department of agriculture will be retained by that department including nursery inspection, and blister rust control.

2. The commission, on finding that an area in the state is infested or threatened with infestation by forest pests, shall determine whether measures of control are needed and are available at reasonable cost with respect to the value of the forest lands or timber to be protected and the area affected.

3. Forest pest control applies to "forests and forest lands" as compared to shade, horticulture, or ornamental trees valuable for landscape, agricultural, aesthetic, or similar purposes.

4. Owners liable for payment of a portion of control costs are any owners with more than 160 acres of forest land in any one county.

5. Authorization is provided for the commission to enter into arrangements and agreements with the university of Wisconsin and other departments of this and other states, the U.S. Department of Agriculture or other federal agencies, and with counties, towns, corporations, and individuals.

6. Owners of forest lands or timber shall control and destroy forest pests but, if the owner fails to do so, the work may be performed by the state as provided in the bill.

7. Provision is made for the establishment of zones of infestation by the commission following due procedures including holding of hearings, and proper notices, or under emergency conditions, the commission may establish

a zone of infestation on its own notice without public hearing and the commission shall apply measures of control on public and private forest lands within established zones if the owner fails, refuses, neglects, or is unable to do so. Provision is also made to enter into agreements with owners covering control work on the lands and fixing a pro rata basis on which costs will be shared between the state and owner. It is expected that agreements would be made with many of the large owners such as industrial concerns in most instances prior to actual control work on establishment of zones of infestation.

8. Costs of control on specific projects are to be shared between the state and the owner but no charges are to be made for salaries or expenses of regular department personnel, operating costs of regular department-owned equipment or for research work in connection with the project.

The state's share shall be not less than 50% of the expenses on forest lands. It follows that the state will bear 100% of the cost on all state-owned lands, school forests, small private ownerships of less than 160 acres of forest land in any one county, and Indian lands with the exception of the Menominee Reservation, the status of which is in question at present. It is understood, as in the case of fire control, that the U.S. Forest Service will bear 100% of the control costs on national forest lands. Owners who have contributed funds, supplies, or services will be credited in the amount furnished.

9. On completion of control work, each landowner will be sent a certified statement covering an equitable share of such expenses. Collection from counties for expenses on forest crop lands will be similar to collection of fire suppression costs except that interest will not be charged and each county will have until October 1 of each year to make payment. No county shall be required to pay more than $5,000.00 in any one year. When control work is done on other public or private lands, the commission shall certify to each owner the claim of the state in writing and owners have 60 days in which to make payment.

10. Whenever the commission finds that forest pest control within an established zone of infestation is no longer necessary or feasible, it may dissolve the zone.

In keeping with the spirit of the law which empowers the commission to enter into arrangements or agreements with other departments of this and other states, federal agencies and other agencies to enable the co-ordination of pest control work, the following agreement was made and entered into:

COOPERATIVE AGREEMENT
Between
THE WISCONSIN STATE DEPARTMENT OF AGRICULTURE,
WISCONSIN CONSERVATION DEPARTMENT
and
UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT PEST CONTROL BRANCH

THIS AGREEMENT, made and entered into by and between the Wisconsin State Department of Agriculture, Wisconsin Conservation Department, and the United States Department of Agriculture, Agricultural Research Service, Plant Pest Control Branch.

WHEREAS, the object of this cooperative agreement is to provide for cooperative surveys to obtain for weekly release during the active season current information on economic insects which will (1) assist farmers and others to more adequately protect their crops from insect attack, (2) assure more prompt detection of newly introduced insect pests, (3) lead to the development of a workable insect pest forecasting service, (4) aid manufacturers and suppliers of insecticides and control equipment to determine areas of urgent need, and (5) in case of necessity, provide a country-wide skeleton structure to be expanded as needed, to combat any attempts at biological warfare.

WHEREAS, the Wisconsin State Department of Agriculture is already equipped with facilities and has or can secure personnel mutually satisfactory to all parties for this work.

WHEREAS, it is the intention of the parties hereto that such cooperation shall be for their mutual benefit and the benefit of the people of the State of Wisconsin and the United States.

NOW THEREFORE, for and in consideration of the promises and mutual covenants herein contained, the parties hereto do hereby mutually agree with each other as follows:

A. The Wisconsin State Department of Agriculture agrees:

1. To furnish one employee, transportation, necessary office or laboratory space, heat, light, water, and clerical services as may be needed to carry out the terms of this cooperative agreement. This employee shall work at a salary consistent with state civil service classification.

2. The employee responsible for this work will remain under the official jurisdiction of the State Department of Agriculture but his advice and guidance shall come from all of the cooperating parties to this agreement through the Chief of the Plant Industry Division, Wisconsin Department of Agriculture.

3. To make available to the University Entomology Department and the Wisconsin Conservation Department a copy of the weekly economic insect report.

4. To submit to the Plant Pest Control Branch at Washington weekly insect condition information for inclusion in the National report, to release all or any part of the information obtained for local consumption and to prepare a yearly summary.

B. The Wisconsin Conservation Department agrees:

1. To provide the Wisconsin State Department of Agriculture economic insect survey information collected in connection with its activities. During the growing season (April 1-October 31), this information would be submitted weekly.

C. The Plant Pest Control Branch agrees:

1. To develop in cooperation with the cooperators the work plan for the employee which will outline over-all plans for carrying out the surveys and reporting the results to the Plant Pest Control Branch through the State Department of Agriculture in order that information will be available for use in the Cooperative Economic Insect Report and recording in permanent insect record files.

2. To pay the Wisconsin State Department of Agriculture $400 per month for each month the service is performed. If for any reason it is not possible to render services on a full monthly basis payment will be determined by dividing the monthly rate into a daily rate based upon a 30-day month.

D. It is mutually agreed that:

1. Normally the survey work will be conducted for a period of 10 months each year, March 1 through December 31.

2. This agreement shall become effective April 1, 1955 and shall continue through June 30, 1955, subject to renewal thereafter between the parties in writing. Further, this agreement is subject to cancellation by either party at any time upon 60 days written notice.

3. Any invention resulting from this cooperative work and made jointly by an employee or employees of the U.S. Department of Agriculture and the cooperator or an employer or employees of the cooperator shall be fully disclosed, either by publication or by patenting in the United States, and any such patent shall either be dedicated to the free use of the people in the territory of the United States or be assigned to the United States of America, in the discretion of said Department, and the said Department shall have an option to acquire the foreign patent rights in the invention for any particular foreign country, said option to expire in the event that the Government fails to cause an application to be filed in any such country on behalf of the Government or determine not to seek a patent in such country within six months after the filing of an application for a United States patent on the invention. Any invention made independently by an employee or employees of the U.S. Department of Agriculture or by the cooperator or an employee or employees of the cooperators working under this agreement shall be

disposed of in accordance with the policy of the U.S. Department of Agriculture, or the cooperator, respectively.

4. It is an express condition of the agreement that it shall not be assigned in whole or in part; that no member of or delegate to Congress or resident commissioner, after his election or appointment, and either before or after he has qualified and during his continuance in office; and no officer, agent or employee of the Government shall be directly or indirectly admitted to any share or part of this understanding or to any benefit to arise hereupon.

/s/ D. N. McDowell
Director, Wisconsin State Dept. of Agr'l

/s/ L. P. Voigt
Director, Wisconsin Conservation Dept.

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE

/s/ W. L. Popham
Chief, Plant Pest Control Branch

/s/ F. H. Spanen
Administrator

To delineate the duties and responsibilities of the survey entomologist assigned to the Wisconsin Department of Agriculture as provided by the foregoing agreement, the following outline serves as a basic work plan for his activities:

COOPERATIVE ECONOMIC INSECT SURVEYS
Between
WISCONSIN STATE DEPARTMENT OF AGRICULTURE,
WISCONSIN CONSERVATION DEPARTMENT
and
THE UNITED STATES DEPARTMENT OF AGRICULTURE
P.P.C.B., A.R.S. ECONOMIC INSECT SURVEY SECTION

WORK PLAN

Under Cooperative Agreement Number 12-14-100-235 (81) providing for a cooperative survey program extending from March 1 through December 31, the following work plan outlines the work program of the survey entomologist assigned:

I. The survey entomologist will work under the direct supervision of the State Entomologist of the Division of Plant Industry of the Wisconsin Department of Agriculture.

II. Will make observations covering economic insect conditions throughout the state during those months the Agreement is in effect. Results of his weekly surveys will be reported to the State Entomologist for immediate use throughout the state to benefit Wisconsin agriculture. Reports will be submitted weekly by the Clearing Office (State Entomologist) or his designated representative to the Economic Insect Survey Section, Washington, D. C. for national release during this period.

III. Will prepare a summary report at the close of the active insect season covering the seasonal insect activity for the State. In this report, emphasis should be placed on crop losses caused by insects throughout the season.

IV. In conducting this work, the surveyor should use standard survey methods when possible. He should strive to improve or develop new techniques when standard methods are not available. He should make collections of pests for positive identification when not possible on site.

V. The surveyor should endeavor to develop voluntary reporting of insect information from as many reliable sources as possible throughout the State.

VI. Make or participate in the following surveys:

1. Corn Borer Survey
2. Armyworm
3. Aphids
4. Detection surveys as the need arises.

VII. Keep under observation the following general economic pests:

1. Hay and forage
   a. Spittle bug

b. Lygus bugs
c. Pea aphid
d. Grasshoppers
e. Other

2. Small Grain
   a. Armyworms
   b. Aphids
   c. Others

3. Row Crops
   a. Soil insects
   b. Webworms
   c. Corn earworm
   d. Aphids
   e. Cutworms
   f. Others

4. Truck Crops
   a. Tomato insects
   b. Potato insects
   c. Sweet Corn insects
   d. Cucumber insects
   e. Others

5. Fruit Insects

6. Stored Grain Pests

7. Ornamental Pests

8. Forest Insects

As a signator of the Cooperative Agreement, the Wisconsin Conservation Department will provide weekly reports on the current status of forest pests.

The surveyor should confine his efforts to those topics outlined above. When emergency situations are encountered he should report immediately to the state entomologist. He should confine his efforts to the broad field of economic entomology except where cooperators jointly agree to temporary assignments on emergency projects. Recommendations should be made in accordance with established practices or those prescribed by the laws of the State of Wisconsin.

Prepared at Madison, Wisconsin
June 22, 1955

by

/s/ E. L. Chambers
State Entomologist

/s/ Leo G. Klausson
Economic Insect Survey Unit

FOREST PEST CONTROL STEERING COMMITTEE

On August 12, 1955, the Wisconsin Conservation Commission took action to establish a Forest Pest Control Steering Committee. The committee is composed of seven members; one from the Department of Agriculture, two from industry, two from the University, and two from the Conservation Department. In establishing the steering committee, individuals were appointed on a staggered two-year basis with the original committee consisting of one member for two years, two for four years, and two for six years. The department personnel are serving at the discretion of the Conservation Commission. Committee personnel are Mr. Bruce Buell (Chairman), Chief Forester, Northern Paper Mills, Green Bay, Wisconsin; Mr. E. L. Chambers, State Entomologist, Department of Agriculture, 315 North Carroll Street, Madison, Wisconsin; Mr. Frank Fixmer, Mosinee Paper Mills, Mosinee, Wisconsin; Dr. James E. Kuntz, Professor of Plant Pathology, 216 Horticulture Building, University of Wisconsin, Madison, Wisconsin; Dr. R. D. Shenefelt, Professor of Entomology, 103 King, University of Wisconsin, Madison, Wisconsin; Mr. S. W. Welsh, Superintendent of Forest Management, Wisconsin Conservation Department, Madison 1, Wisconsin; and Mr. Norbert B. Underwood, Forest Entomologist, Griffith State Nursery, Wisconsin Rapids, Wisconsin.

The following is a copy of a statement prepared by members of the Forest Pest Control Steering Committee outlining the purpose or specifying the function and responsibilities of the committee:

Function and Responsibilities of the Forest Pest Control Steering Committee

The Forest Pest Control Steering Committee is purely advisory in nature. In this capacity, it should not and cannot accept responsibility for the administration or conduct of any of the active phases of forest pest control in Wisconsin.

The committee should investigate and analyze thoroughly the field of forest pest control as related to the state of Wisconsin and make recommendations to the Wisconsin Conservation Department accordingly.

The function of the Forest Pest Control Steering Committee is to give advice regarding the implementation and interpretation of the various matters regarding the investigation and control of forest pests as they are stated in Chapter 250, Wisconsin Laws of 1955. The policies, organizations and programs set up or to be set up to accomplish control of forest pests are the primary subjects for consideration. While the committee will, in general, deal in terms of broad policies, it will probably be necessary to deal with some problems in detail until the broad policies begin to emerge.

Among the items which the committee should investigate and make recommendations upon are (The order in which items are listed has no bearing upon the order in which they should be taken up by the committee):

I. Organizational problems

1. Necessary organization
2. Facilities
3. Funds (contingency fund)
4. Man power
5. (Establishment of relationship of the committee to Research Advisory Committee, etc.)

II. Surveys

1. Purposes and types
2. Who? How?

III. Investigation

1. What should the department do?
2. What should be farmed out?

IV. Control

1. Legal aspects
   a. Responsibilities of
      (1) Landowner
      (2) Department
   b. Assessment of costs

2. Operational aspects
   a. How set up an infestation zone?
   b. How dissolve one?

3. Cost aspects

4. Types of control and their emphasis

V. Cooperative agreements

1. Agreements to do what?
2. Methods of coordinating results, i.e., exchanging information

VI. Annual work programs

VII. Development of public recognition and interest

VIII. Record systems

Since the committee is advisory in nature, it is understood that its recommendations will be made to the Conservation Department for its guidance to be used as the department sees fit.

MEETINGS **** CONFERENCES **** SCHOOLS

Below are listed the more important meetings, conferences, and schools which Wisconsin Conservation Department personnel either attended, participated in, or conducted for the purpose of gaining a broader perspective, integrating programs, and instructing others.

February 3-4 Fifth Annual Forest Insect Survey Conference held in Minneapolis. Survey and control methods and procedures were discussed. Survey techniques for six forest pests were presented, discussed, approved and accepted by the group subject to trial in the field. Approximately fifty people from the Lake States area were present. Industry was represented for the first time.

March 22-24 Third training school for detection personnel held at Eagle River, sponsored by the Wisconsin Conservation Department in cooperation with the University of Wisconsin, State Department of Agriculture, U.S. Forest Service, and Trees for Tomorrow. Basic concepts of entomology, pathology, and forest management were presented. Life histories, identification, damage, and control of specific insects and diseases were discussed.

May 13 Field training session in the survey and control of the spruce budworm held at Ely, Minnesota. Sponsored by the U.S. Forest Service.

July August Tours for observers conducted in the field at Black River Falls, Wautoma, Gordon, and Antigo. The purpose of the tours was to acquaint observers with the various pests present in their area and their damage symptoms.

August 30-31 Lake States Forest Genetics Conference at Wisconsin Rapids. (See Lake State Forest Experiment Station Misc. Report No. 40.)

November 18-19 Fourth Central International Forest Insect and Disease Conference held at East Lansing, Michigan.

December 19 Conference between members of the U.S. Forest Service, Regional Office in Milwaukee and the Wisconsin Conservation Department for the purpose of discussing forest pest control work and integrating programs more closely.

PUBLICATIONS OF INTEREST

Insect Enemies of Eastern Forests. U. S. Dept. of Agriculture Misc. Publ. No. 657. Craighead, F.C. et al 1950.

Forest Entomology. Graham, S.A. 1952

Important Tree Pests of the Northeast. Committee on Tree Pest Leaflets of the New England Section of the Society of American Foresters. Compiled by Baldwin, H.I. 1952.

Insects of Wisconsin Forests. University of Wisconsin College of Agriculture Extension Service--Experiment Station and Wisconsin Conservation Department. Information on the more important insects by R.D. Shenefelt and D.M. Benjamin, 1955.

Pests and Diseases of Trees and Shrubs. Wisconsin State Department of Agriculture Bulletin No. 330 E. L. Chambers et al

Some Forest Insect and Disease problems of Canada. Forest Biology Division Science Service Department of Agriculture.

The Redheaded Pine Sawfly U.S.D.A. Leaflet No. 296

The Saratoga Spittlebug U.S.D.A. Forest Service Leaflet No. 3

The Spruce Budworm U.S.D.A. Leaflet No. 242

The Biology and Ecology of the Red-Headed Pine Sawfly U.S.D.A. Forest Service Technical Bulletin No. 1118 D. M. Benjamin

Biology and Control of the European Pine Shoot Moth Research Bulletin 760 Ohio Agricultural Experiment Station W. E. Miller and R. B. Neiswander

European Pine Shoot Moth Attacks Red Pine Plantations Circular 67 West Virginia University Agricultural Experiment Station

Control of White Pine Blister Rust U.S.D.A. Leaflet No. 265

Saving White Pines by Removing Blister Rust Cankers U.S.D.A. Circular No. 948

Illinois Trees: Their Diseases Illinois Natural History Survey Circular 46 J. Cedric Carter

Oak Wilt in Wisconsin Stencil Bulletin 9 Agricultural Experiment Station

The Distribution and Prevention of Oak Wilt Circular 448 Pennsylvania State College of Agriculture

Control of the Dutch Elm Disease Cornell Extension Bulletin 932

Dutch Elm Disease Control Extension Folder F-195 Michigan State University Extension Service F. C. Strong, R. L. Janes, W. F. Morofsky

Elm Bark Beetles Leaflet No. 185 U.S.D.A.

Phloem Necrosis A Virus Disease of the American Elm Circular 640 U.S.D.A.

DDT: Its Effect on Fish and Wildlife, Circular 11 U. S. Dept. of the Interior Fish and Wildlife Service

Preventing Damage By Lyctus Powder--Post Beetles Farmers' Bulletin No. 1477 U.S.D.A.

Powder Post Beetles in Buildings Leaflet No. 358 U.S.D.A.

Forest Insect Conditions in the Lake States Lake States Forest Experiment Station Station Paper No. 35

DIRECT CONTROL OPERATIONS

Aerial spraying was done on 500 acres in Adams County in an effort to eliminate the European pine sawfly Neodiprion sertifer (Geoff.). See Item 3 under List of Insects and Diseases reported.

Aerial spraying was conducted on 2,366 acres of state, county, and industrial forest land to control the Saratoga spittlebug Aphrophora saratogensis (Fitch).

Hand spraying to control the red-headed pine sawfly Neodiprion leontei (Fitch) was conducted in various parts of the state.

Ground spraying by private landowners was also done in the northwest part of the state to control the forest tent caterpillar Malacosoma disstria on and adjacent to their property.

Direct control operations were carried on in the control of white pine tip weevil Pissodies strobi (Peck) by removal of infested tips by pruning.

Approximately 7,400 acres of red pine plantation on the Nicolet and Chequamegon National Forests were sprayed to prevent damage by the Saratoga spittlebug.

LIST OF INSECTS AND DISEASES REPORTED

The more important species are discussed in some detail while those of less importance are mentioned briefly. Since this report is based on reconnaissance surveys, no attempt is made to define or separate infestations causing economic losses in forest stands from those that are appearing in epidemic proportions while exerting little influence in growth, mortality, or composition of the stand.

It is very difficult to describe insect abundance so that all concerned with the survey will have the same interpretation. Actual numbers may be used in sampling when conducting a reconnaissance survey and serve a limited capacity. They can, however, give a false impression unless other factors as site, host health, class, degree and effectiveness of inhibiting factors, etc. are also known. Some or all of these factors are considered when conducting an appraisal survey. The criterion of abundance used in this report is purely relative and very general. Specific information as to the location of the more important infestations of certain species may be had by writing to this department or referring to the maps on pages 22 to 31.

Criterion of abundance:

absent -- no pests found on host trees.
scarce (light) -- a few individuals present; no perceptible damage.
moderately abundant (medium) -- damage general throughout area of infestation and possibly some form of decadence evident; center of infestation may show severe damage.
very abundant (heavy) -- damage severe throughout area of infestation; some trees may be dead and others in a dying condition or insects may be doing maximum amount of damage of which they are capable of doing.

MORE IMPORTANT INFESTATIONS

1. Forest Tent Caterpillar - Malacosoma disstria Hbn. Based on a winter egg band survey made in early December of 1954, it appeared that the infestation had reached its peak the same year and was on the decline. However, observations made in the field indicated a sharp decline in the native parasitic fly, Sarcophaga aldrichi Park. This decline was attributed to a long period of wet weather which induced the growth of a parasitic fungus (Empusa sp.) on the flies. Due to the high mortality among the flies, parasitism of the cocoons was very spotty and varied greatly from area to area.

A winter egg band survey indicates little change in the infestation in 1956. Individual copies of the map may be had by writing to the Conservation Department, State Office Building, Madison 1, Wisconsin.

The caterpillar remained a nuisance in the northwest area and portions of the north and northeast part of the state. Heavy infestations were reported in northwest Iron, eastern Vilas, and northern Lincoln County. Most of the northwestern counties sustained heavy to complete defoliation of aspen, but other hardwoods were not as heavily defoliated as the previous year. Generally, defoliation was heavier in the southern portion of the infestation and lighter in the extreme north along Lake Superior.

2. Jack Pine Budworm - Choristoneura pinus Free. The area infested by this pest increased substantially this year. The largest heavy infestation is in Douglas County and encompasses some 62,000 acres of jack pine (see map, page 25). The heavy center of infestation in Washburn County collapsed but the intensity of the infestation has increased in Burnett County with the heaviest defoliation occurring in the town of Sterling. A severe outbreak totaling 13,000 acres has been reported from the towns of Stevenson and Silver Cliff in Marinette County. A similar outbreak of approximately 9,000 acres was reported in the town of Cassion in Oneida County. Lighter infestations were reported in Buffalo, Chippewa, Jackson, and Clark Counties. The total area of infestation ranging from medium to heavy is in excess of 114,000 acres.

3. European Pine Sawfly - Neodiprion sertifer (Geoff.) Specimens collected by the State Department of Agriculture from a windbreak in Adams County in 1954 were identified late the same year as European pine sawfly. An intensive egg survey was conducted during the winter and early spring. Egg batches were marked and regularly observed preparatory to spraying. A 500-acre area was sprayed with DDT in an effort to eliminate the pest. The insecticide was applied on May 20 and on May 28, in cooperation with the University, a selective insect virus was applied. An intensive post-spray appraisal of the area could produce no European pine sawfly larvae. On November 2, adult chalcid parasites (Dahlbominus fuscipennis) (Zetterstedt) were released by the University in the Strong's Prairie area.

4. Introduced Pine Sawfly - Diprion similis (Htg.) The range of this pest has increased to include every county in the northwest. A total of 22 counties have reported the insect. Infestations were reported as light but resort owners near the city of Hayward sustained complete defoliation of ornamental white pines.

5. Red-headed Pine Sawfly - Neodiprion lecontei (Fitch) Light infestations were reported in Sawyer, Washburn, Chippewa, Rusk, Trempealeau, Outagamie, Buffalo, Marquette, Wood, Columbia, Oconto, Forest, Langlade, and Vilas Counties.

6. Jack Pine Sawfly - Neodiprion pratti banksianae Roh. A heavy infestation was reported on 15 acres of pole-size jack pine in the town of Bradley, Lincoln County. Light infestations were reported in Douglas and Jackson Counties.

7. Larch Sawfly - Pristiphora erichsonii (Htg.) In general, the larch sawfly was prevalent in larch stands over the entire northern half of the state. Some stands were completely defoliated in each county; others suffered light to moderate defoliation.

In the central portion of the state, severe defoliation was reported in Waupaca and Monroe Counties and light defoliation in Jackson, Clark, and Outagamie Counties.

8. Balsam Fir Sawfly - Neodiprion abietis (Harr.) High populations were reported in balsam fir stands in Door County. Defoliation was heavy but not severe enough to cause mortality except on some scattered trees that were generally in poor condition. Light populations occurred on balsam fir and spruce in Oconto, Shawano, Langlade, Clark, Chippewa, and Sawyer Counties.

9. Red Pine Sawfly - Neodiprion nanulus nanulus Schedl Light populations were reported infesting Norway and jack pine in the central and northern portions of the state. Defoliation was limited to a few branches on individual trees.

A heavy infestation was reported in Columbia County on Norway pine. The most severe part of the infestation was on a slope with a north exposure. The surface drainage was good but the subsurface drainage was medium to poor.

10. Saratoga Spittlebug - Aphrophora saratogensis (Fitch) Norway and jack pine plantations were heavily damaged in Sawyer, Vilas, Oneida, Lincoln, and Langlade Counties. Nymphal surveys were conducted in June and early July resulting in the spraying of 2,366 acres.

Light to moderate infestations were reported in Washburn, Price, Marinette, Oconto, and Eau Claire Counties.

11. Pine Tortoise Scale - Toumeyella numismaticum (P. & M.) Heavy infestations were observed in young plantations of jack pine in Marinette County and some mortality occurred. Light infestations were reported in Vilas, Iron, Langlade, Clark, Eau Claire, and Jackson Counties.

A heavy infestation in Sawyer County was brought under control by ladybird beetles and other enemies.

A project on the study of resistance of jack pine to the pine tortoise scale has been initiated under a grant from the Wisconsin Alumni Research Foundation. The purpose of the study is to determine the mechanism of resistance and ascertain whether it is hereditary in nature.

12. White Pine Weevil - Pissodes strobi (Peck) Heavy infestations were reported on jack pine plantings in Sawyer, Bayfield, Vilas, and Marinette Counties. Generally, the insect was heavy on open-growing white pine over the entire northern half of the state. Reports of attacks on Norway pine plantings were general and heavy enough to cause concern among the foresters.

13. European Elm Bark Beetle - Scolytus multistriatus (Marsh) Specimens have been found further north and west. To date, no sign of Dutch elm disease (Ceratostomella ulmi) (Schwarz) (Ruisman), of which the elm bark beetle is the vector, have been reported in the state. The map (page 28) on elm bark beetle indicates the probable extent of the bettle in Wisconsin. This map is based on points farthest north and west where infestations were found. The map (page 29) on Dutch elm disease indicates the known extent of the disease in Illinois based on information furnished by Dr. J. C. Carter of the Illinois Natural History Survey. Dr. Carter points out that there is no systematic survey made in each county to locate the disease in Illinois. It is possible that it may be in other counties, especially Boone and McHenry. It is very probable that the disease is already present in Wisconsin but has not been discovered or has not exhibited the typical wilt symptoms associated with it.

14. European Pine Shoot Moth - Rhacionia buoliana (Schiff.) Light infestations were reported in Dodge, Washington, and Fond du Lac Counties. Infestations

in Sheboygan County ranged from light to medium. Most reports were of attacks on ornamental plantings.

15. Spruce Budworm - Choristoneura fumiferana (Clem.) Only scattered specimens were found on white spruce in Vilas, Langlade, and Oneida Counties. Balsam fir in mixture with Norway pine in Chippewa County resulting in minor defoliation.

16. Saddled Prominent - Heterocampa guttivitta (Wlkr.) Outbreak proportions were reached in Shawano and Marathon Counties in stands that were predominantly hard maple. Complete defoliation was sustained by some of the trees for the second year but no adverse effects were noted.

17. Maple Webworm - Tetralopha spp. Infestations in which defoliation was heavy to complete, occurred in Shawano, Marathon, Langlade, and Marinette Counties. Damage was most severe in stands that were predominantly hard maple.

18. Birch Leaf Skeletonizer - Bucculatrix canadensisella Cham Premature discoloration and loss of foliage was caused, as it has been the past two years, to most white birch in the state. Heavy infestations were reported in Vilas, Florence, Oneida, Monroe, Dunn, and Barron Counties.

INFESTATIONS OF LESSER IMPORTANCE

1. Yellow-headed Spruce Sawfly - Pikonema alaskensis (Roh.) A small number of larvae were reported on ornamental spruce in Vilas County and in a plantation in Oconto County. Larvae were also found on ornamental white spruce near Round Lake, Sawyer County.

2. Walkingstick - Diapheromera femorata (Say) Complete defoliation of oak stands in Shawano, Marathon, and Marinette Counties. Populations ranging from light to moderate were reported in portions of Bayfield and Eau Claire Counties.

3. Larch Casebearer - Coleophora laricella (Hbn.) The infestation was general throughout the northern half of the state. Heavy populations were observed in Marinette, Shawano, Price, Clark, and Waupaca Counties. Other counties reported light to medium damage.

4. Green-striped Maple Worm - Anisota rubicunda (F.) A heavy infestation completely defoliated fifteen acres of hardwood in the town of Spruce, Oconto County.

5. Balsam Gall Midge - Itonida Balsamicola - (Lint.) Heavy infestations occurring in Langlade and Oconto Counties caused concern among Christmas tree growers.

The following is a list of other forest insects reported by insect observers:

Fall Webworm	Hyphantria cunea (Drury)
Cherry Scallop Shell Moth	Calocalpe undulata (L.)
Dusky Birch Sawfly	Croesus latitarsus Nort.
Palmerworm	Dichomeris ligulella Hbn.

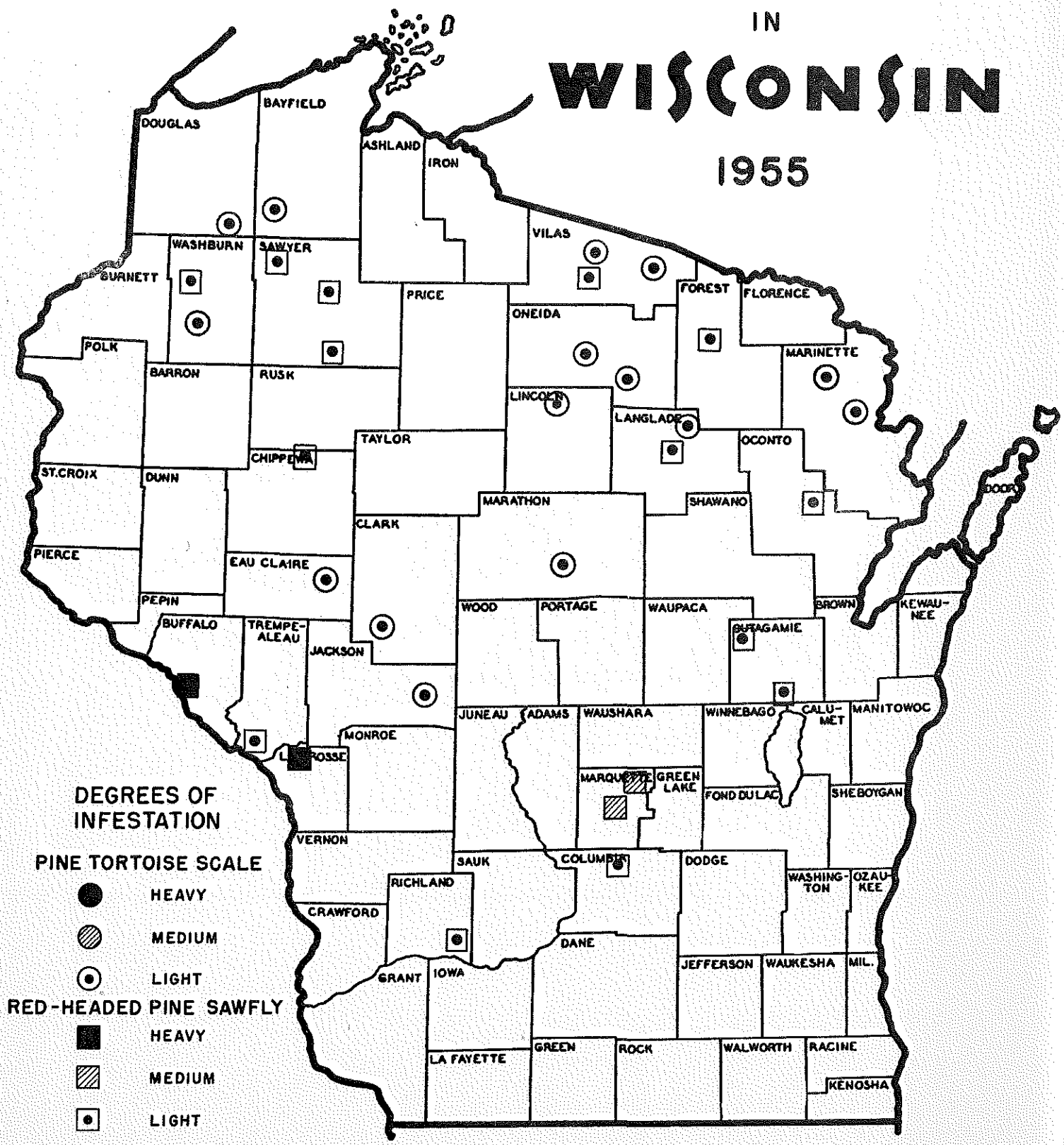
Mourning Cloak Butterfly	Nymphalis antiopa (L.)
Elm Sawfly	Cimbex americana Leach
Ugly Nest Caterpillar	Archips cerasivorana (Fitch)
Oak Leaf Roller	Archips fervidana (Clem.)
White Pine Aphid	Cinara strobi (Fitch)
Spruce Needle Miner	Recurvaria piceaella (Kearf.)
Black Headed Ash Sawfly	Tethida cordigera (Beauv.)
Pine False Webworm	Acantholyda erythrocephala (L.)
Ocellate Maple Leaf Gall	Itonida ocellaris (O.S.)
Cockscomb Gall Aphid	Colopha ulmicola (Fitch)
Pine Needle Scale	Phenacaspis pinifoliae (Fitch)
Pine Tube Moth	Argyrotaenia pinatubana (Kearf.)
Eastern Tent Caterpillar	Malacosoma americanum (F.)
Cottony Maple Scale	Pulvinaria vitis (L.)
Pine Webworm	Tetralopha robustella Zell.
Brown Elm Scale	Lecanium corni Bouché
Maple Leaf Roller	Sparganothis pettitana (Robinson)
Eastern Spruce Gall Aphid	Chermes abietis L.
Large Aspen Tortrix	Archips conflictana (Wlkr.)
Aspen Blotch Miner	Lithocolletis tremuloidiella (Braun)
Walnut Datana	Datana integerrima G. & R.
Pine Root Collar Weevil	Hylobius radicis Buch.
Jack Pine Eucosma	Eucosma sonomana (Kearf.)
Pitch Twig Moth	Petrova albicapitana (Busck)
Pine Spittlebug	Aphrophora parallela (Say)

FOREST DISEASES REPORTED IN WISCONSIN - 1955

*1.	White Pine Blister Rust	Cronartium ribicola Fischer
2.	Sweet Fern Blister Rust	Cronartium comptoniae Arth.
3.	Oak Gall Rust	Cronartium cerebrum Hedgc. and Long
4.	Shoestring Root Rot	Armillaria mellea (Vahl.) Quel.
5.	Pine Needle Rust	Coleosporium solidaginis (Schw.) Thum.
6.	Needle Cast	Hypodermella ampla (Davis) Dearn.
7.	Needle Cast	Loplodermium sp.
8.	Maple Anthracnose	Gloeosporium apocryptum Ell. and Ev.
9.	Oak Wilt	Endoconidiophora fagacearum (Henry) Bretz
10.	Maple Die-back	Causal agent unknown
11.	White Pine Blight	Causal agent unknown
12.	Sweetfern Blister Rust	Cronartium comptoniae
13.	Cedar Apple Rust	Gymnosporangium juniperi-virginianae
14.	Cedar Apple Rust	Gymnosporangium globosum

*For information on white pine blister rust write to: State Entomologist's Office, 315 North Carroll Street, Madison 3, Wisconsin.

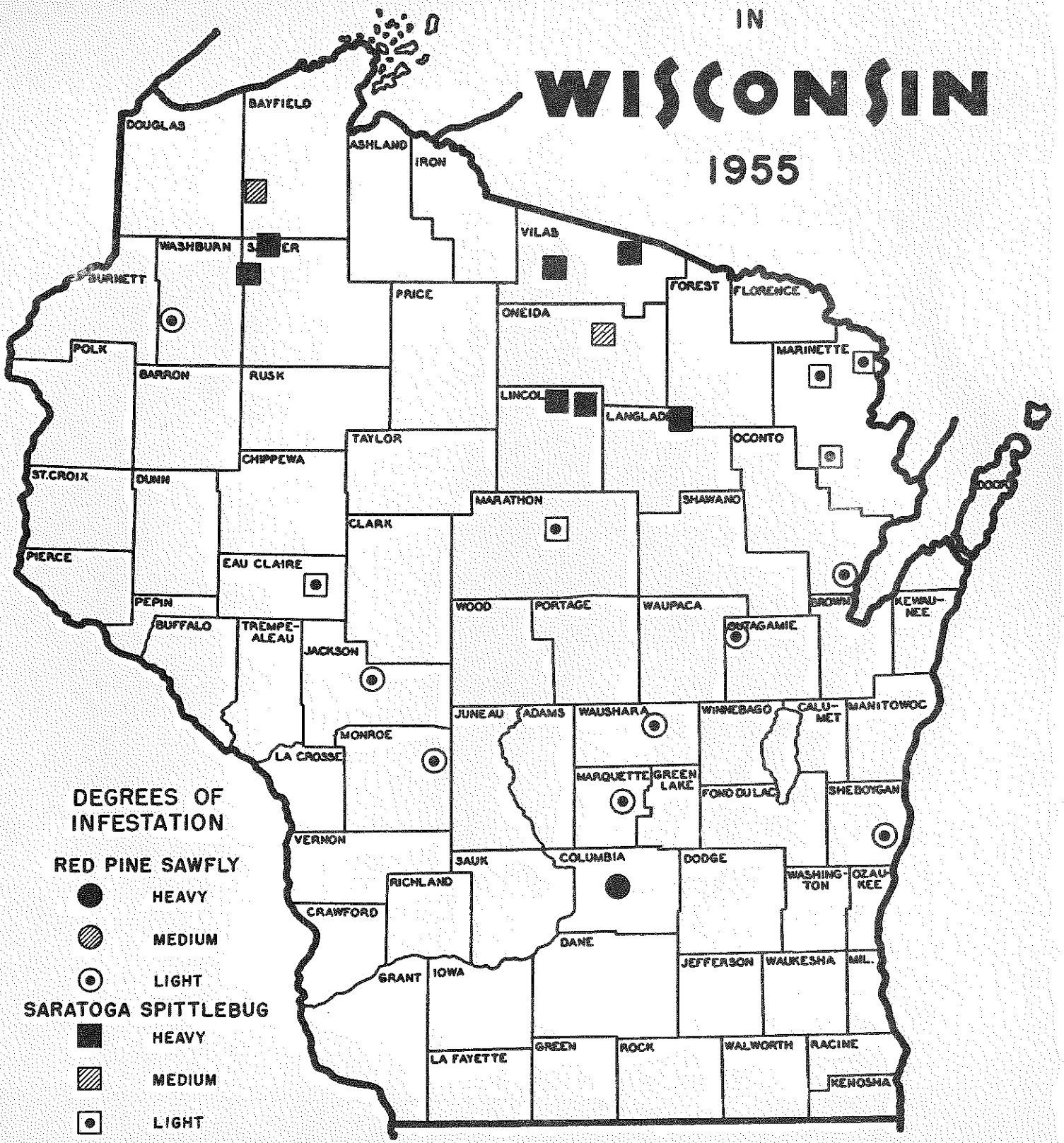
FOREST INSECT CONDITIONS IN WISCONSIN 1955



AREAS OF THE IMPORTANT INFESTATIONS IN 1955

WISCONSIN CONSERVATION DEPARTMENT

FOREST INSECT CONDITIONS IN WISCONSIN 1955



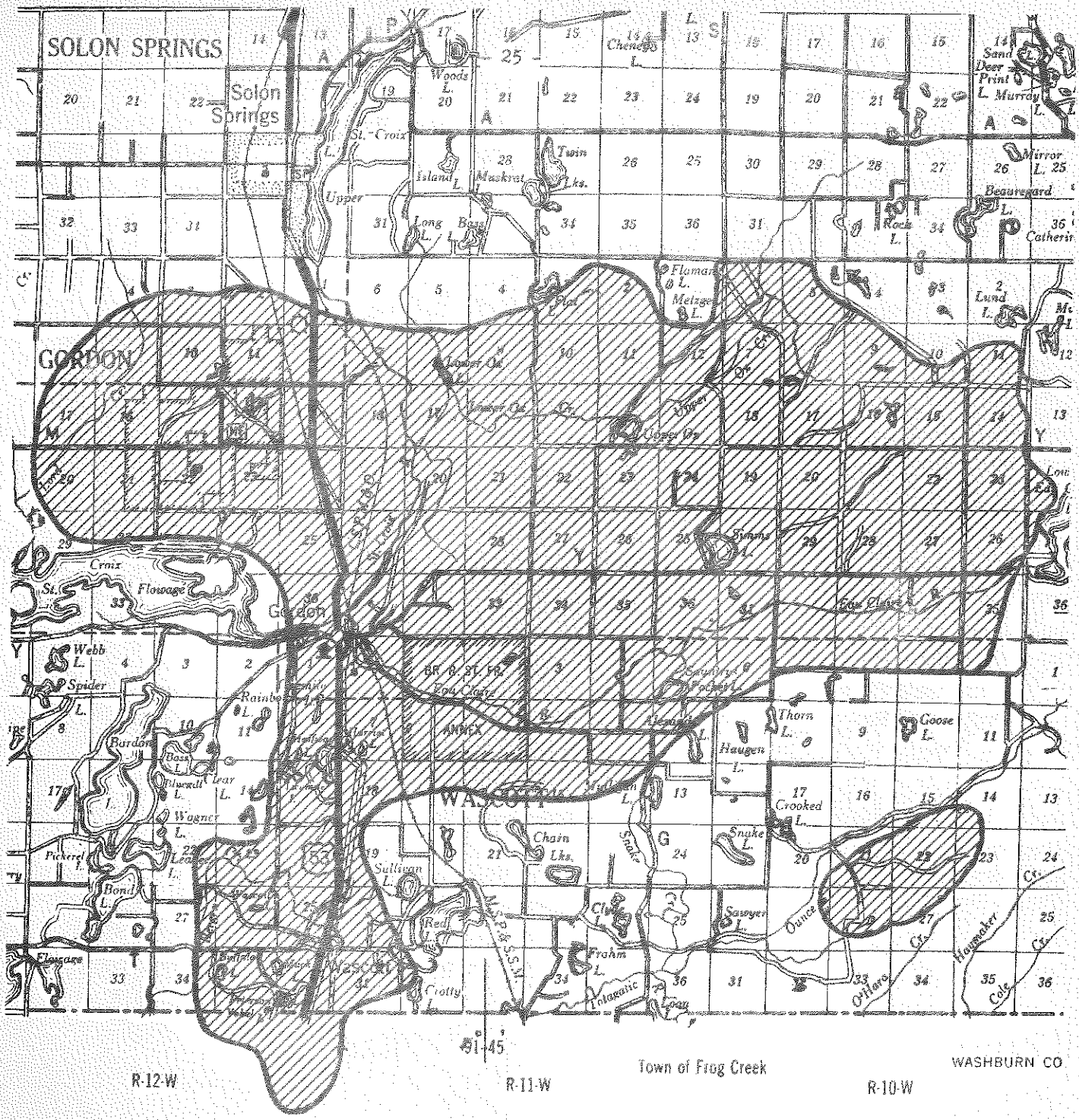
AREAS OF THE IMPORTANT INFESTATIONS IN 1955

WISCONSIN CONSERVATION DEPARTMENT

FOREST INSECT CONDITIONS IN WISCONSIN 1955

AREAS OF THE IMPORTANT INFESTATIONS IN 1955

WISCONSIN CONSERVATION DEPARTMENT



DOUGLAS CO.

HEAVY INFESTATION OF JACK PINE BUDWORM IN DOUGLAS COUNTY 1955

GROSS ACREAGE – 62,000 ACRES

SCALE 0 1 2 3 4 MILES

WISCONSIN CONSERVATION DEPARTMENT

FOREST INSECT CONDITIONS IN WISCONSIN 1955

EXTENT OF THE INTRODUCED PINE SAWFLY (Diprion similis) INFESTATION

WISCONSIN CONSERVATION DEPARTMENT

FOREST INSECT CONDITIONS IN WISCONSIN 1955

EXTENT OF THE EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana) INFESTATION

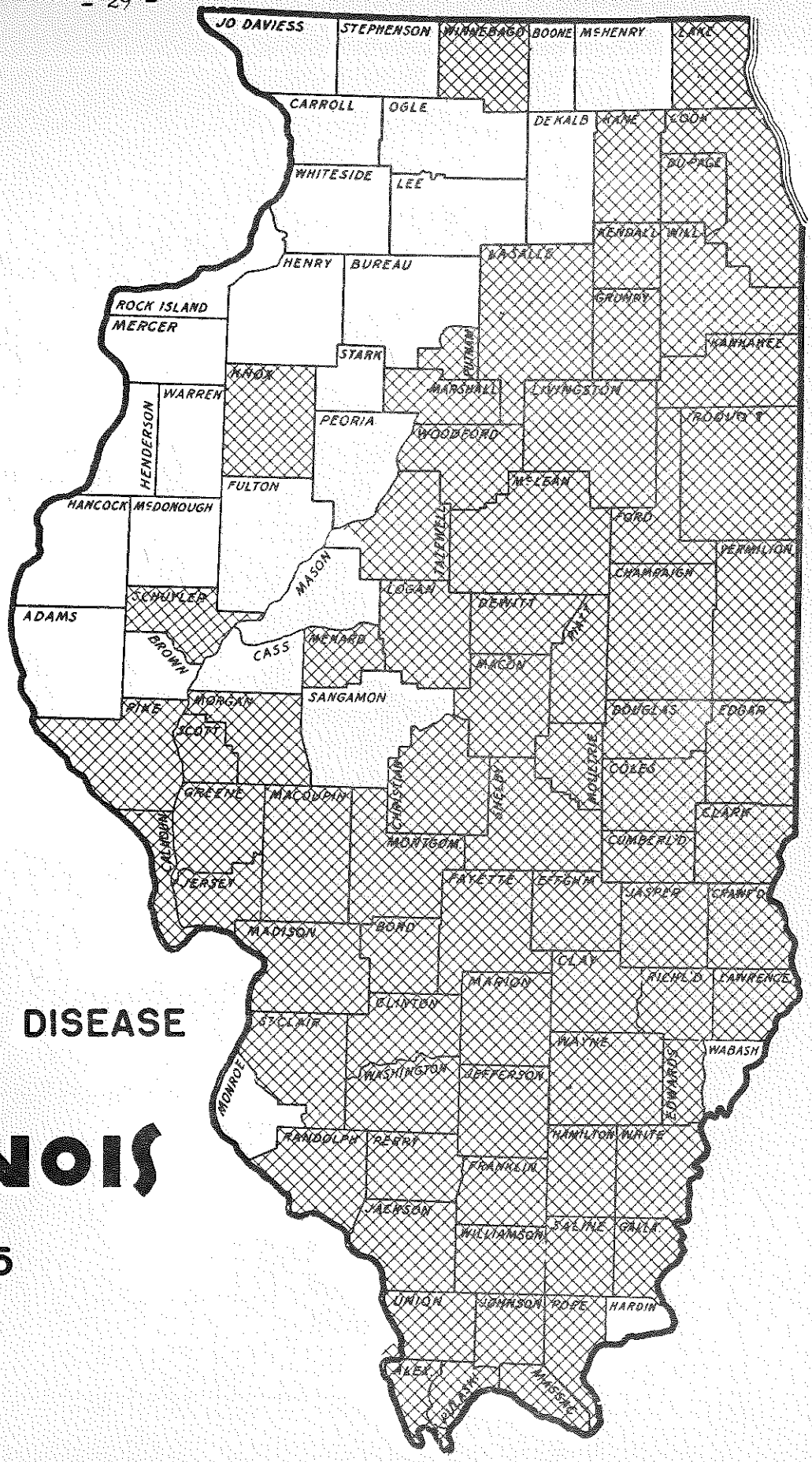
WISCONSIN CONSERVATION DEPARTMENT

FOREST INSECT CONDITIONS IN WISCONSIN 1955

PROBABLE EXTENT OF THE EUROPEAN ELM BARK BEETLE (Scolytus multistriatus) INFESTATION

* See note on page

WISCONSIN CONSERVATION DEPARTMENT



DUTCH ELM DISEASE IN ILLINOIS 1955

KNOWN EXTENT OF THE DUTCH ELM DISEASE IN ILLINOIS IN 1955

Courtesy of Dr. J.C. Carter, Illinois Natural History Survey

* See note on page

FOREST INSECT CONDITIONS IN WISCONSIN 1955

FOREST TENT CATERPILLAR INFESTATION 1955

WISCONSIN CONSERVATION DEPARTMENT

FOREST INSECT CONDITIONS IN WISCONSIN 1956

ANTICIPATED AREAS AND DEGREES OF INFESTATIONS FOR 1956 BASED ON A WINTER EGG BAND SURVEY

WISCONSIN CONSERVATION DEPARTMENT